Spring 2014 Student Performance Analysis

Grade 7 Mathematics Standards of Learning

Presentation may be paused and resumed using the arrow keys or the mouse.

VIRGINIA DEPARTMENT OF EDUCATION

Comparing and Ordering Fractions, Decimals, Percents, and Numbers Written in Scientific Notation

SOL 7.1

The student will

a) investigate and describe the concept of negative exponents for powers of ten;

b) determine scientific notation for numbers greater than zero;

c) compare and order fractions, decimals, percents and numbers written in scientific notation;

d) determine square roots; and

e) identify and describe absolute value for rational numbers.

Suggested Practice for SOL 7.1c

Students need additional practice comparing numbers written in scientific notation.

Identify two numbers that have a value less than 3.

2.9×10^{1} 3.2×10^{3}

2.9×10^{0} 3.2×10^{-2}

Suggested Practice for SOL 7.1c

Students need additional practice comparing fractions, decimals, percents, and numbers written in scientific notation.

Which number would make the sentence true?

$$\frac{2}{11} < \square < 1.42$$

A $1\frac{2}{3}$

B 0.153

C 22%

D 1.3×10^1

Using Proportional Reasoning

SOL 7.4

The student will solve single-step and multistep practical problems, using proportional reasoning.

Suggested Practice for SOL 7.4

Students need additional practice finding the discounted price of an item.

The original price of a chair was $545.00. A store discounted the price of this chair by 25%. What is the exact price of the chair, not including tax, with this discount?

A $136.25 ← Most common error

B $408.75

C $520.00

D $681.25

Suggested Practice for SOL 7.4

Students need additional using proportional reasoning to solve a problem.

Max ran 5 miles on Thursday. One mile is equal to 5,280 feet. Which proportion can be used to determine how many feet, x, Max ran on Thursday?

A $\frac{1}{5,280} = \frac{5}{x}$

B $\frac{1}{5} = \frac{x}{5,280}$

C $\frac{1}{5,280} = \frac{x}{5}$

D $\frac{1}{x} = \frac{5,280}{5}$

Describing Surface Area and Volume

SOL 7.5

The student will

a) describe **volume and** surface area of cylinders**;**

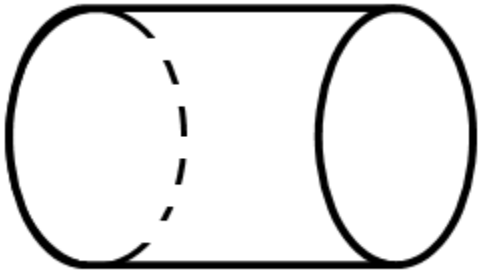
b) solve practical problems involving the volume **and surface area** of rectangular prisms **and cylinders; and**

c) describe how changing one measured attribute of a rectangular prism affects its volume **and surface area.**

Suggested Practice for SOL 7.5a

Students need additional practice describing the surface area of a cylinder.

One way to determine the surface area of this cylinder is to –



A add the areas of both bases to the rectangular area around the cylinder

B add the areas of both bases

C multiply the area of the base by the height

D multiply the rectangular area around the cylinder by pi

Suggested Practice for SOL 7.5b

Students need additional finding the volume of a cube, given its edge length.

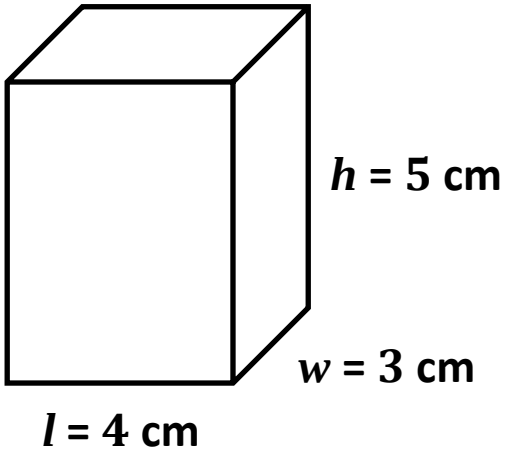
A container in the shape of a cube will be completely filled with sand. The container has an edge length of 8 inches. What is the exact number of cubic inches of sand needed to completely fill the container?

512 **cubic inches**

Suggested Practice for SOL 7.5c

Students need additional practice describing how a change in one measured attribute of a rectangular prism impacts volume.

Rectangular Prism A is shown.



Rectangular Prism B has the same height and width as rectangular Prism A but its length is 8 inches. The volume of Prism B is –

A twice the volume of Prism A

B one-half the volume of Prism A ← Most common error

C one-fourth the volume of Prism A

D four times the volume of Prism A

Classifying Quadrilaterals

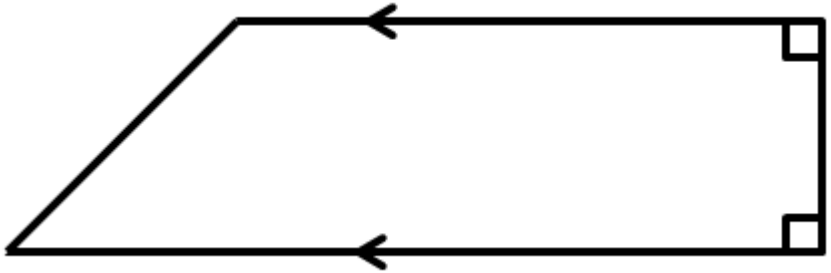
SOL 7.7

The student will compare and contrast the following quadrilaterals based on properties: parallelogram, rectangle, square, rhombus, and trapezoid.

Suggested Practice for SOL 7.7

Students need additional practice classifying a given figure.

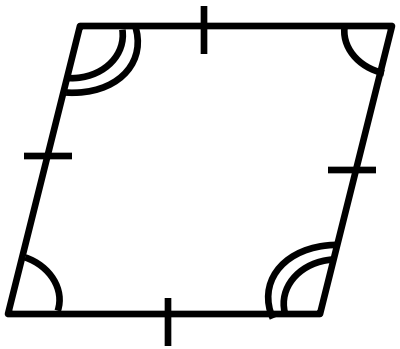
Which classifications must describe the figure shown?



A square and parallelogram
B trapezoid and parallelogram
C square and quadrilateral
D trapezoid and quadrilateral

Suggested Practice for SOL 7.7

Select each classification that does NOT describe this figure.



Parallelogram	Rhombus	Rectangle
Trapezoid	Square	Quadrilateral

Representing Transformations on the Coordinate Plane

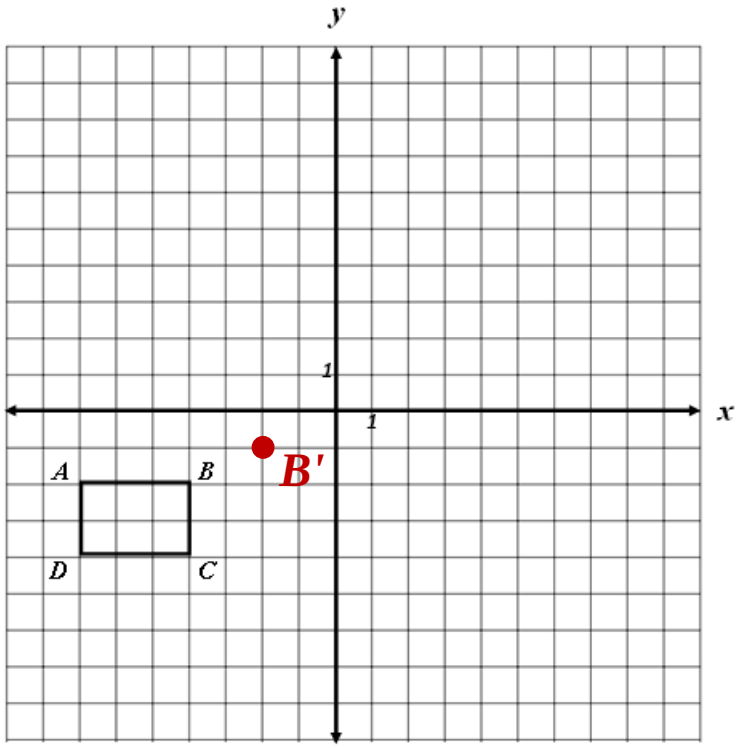
SOL 7.8

The student, given a polygon in the coordinate plane, will represent transformations (reflections, dilations, rotations, and translations) by graphing in the coordinate plane.

Suggested Practice for SOL 7.8

Students need additional practice dilating a figure on a coordinate plane.

Polygon $ABCD$ is dilated by a scale factor of $\frac{1}{2}$ using the origin as the center of dilation. What coordinate pair best represents the image of B ?



A $(4, 2)$

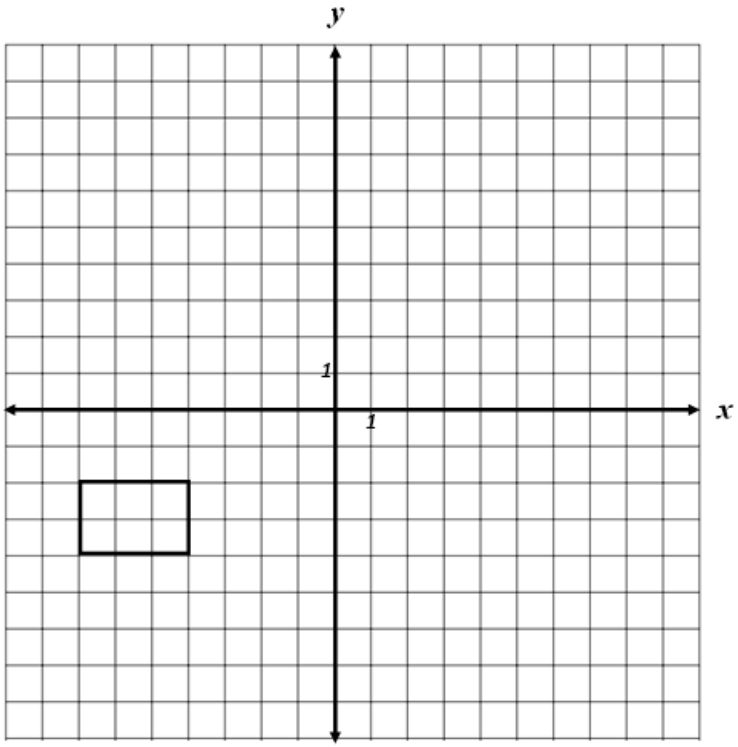
B $(-2, 1)$

C $(4, -2)$

D $(-2, -1)$

Suggested Practice for SOL 7.8

A rectangle is plotted on the coordinate plane as shown.



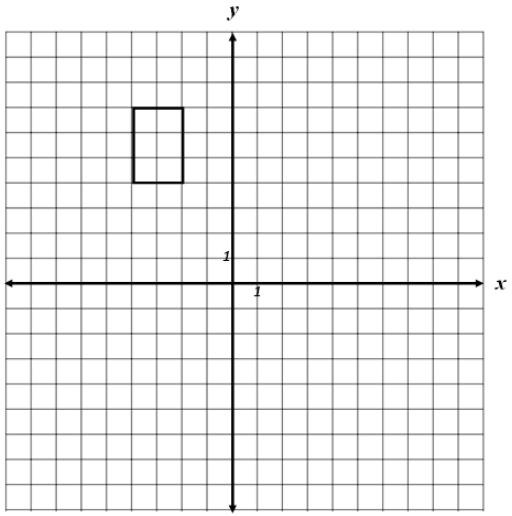
Which graph shows the rectangle rotated 90 degrees counterclockwise about the origin?

(Answer choices are on the next screen.)

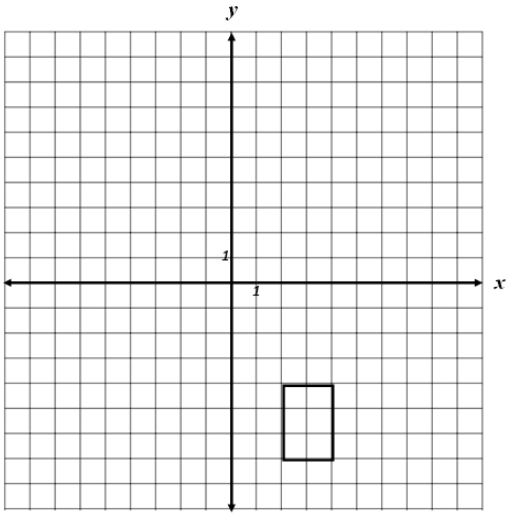
Suggested Practice for SOL 7.8

Which graph shows the rectangle rotated 90 degrees counterclockwise about the origin?

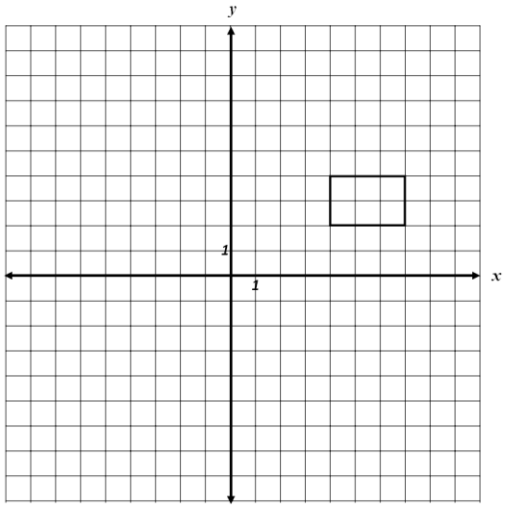
A



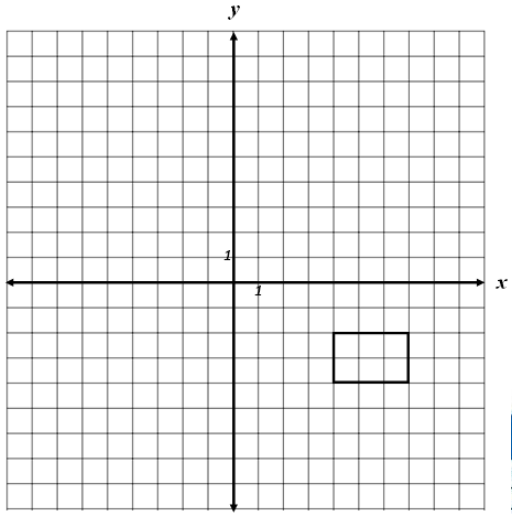
B



C



D



Using the Fundamental Counting Principle

SOL 7.10

The student will determine the probability of compound events, using the Fundamental (Basic) Counting Principle.

Suggested Practice for SOL 7.10

Students need additional practice determining probability of compound events.

This table shows the types of pizza and drink selections at a party.

Type of Pizza	Drink
Pepperoni	Apple Juice
Vegetable	Orange Juice
Plain Cheese	Cola
	Water

Maya will randomly select one type of pizza and one drink from these choices. What is the probability that Maya will select pepperoni pizza and cola?

A $\frac{1}{12}$

B $\frac{1}{7}$

C $\frac{2}{7}$

D $\frac{3}{4}$

Most common error

Representing Relationships

SOL 7.12

The student will represent relationships with tables, graphs, rules, and words.

Suggested Practice for SOL 7.12

Students need additional practice representing an equation with a table of values.

Which table of values represents the same relationship as the rule $y = 3(x + 2)$?

A

x	y
-3	-3
0	6
5	21

B

x	y
-3	-15
-2	0
5	21

C

x	y
-3	-3
-2	-12
5	24

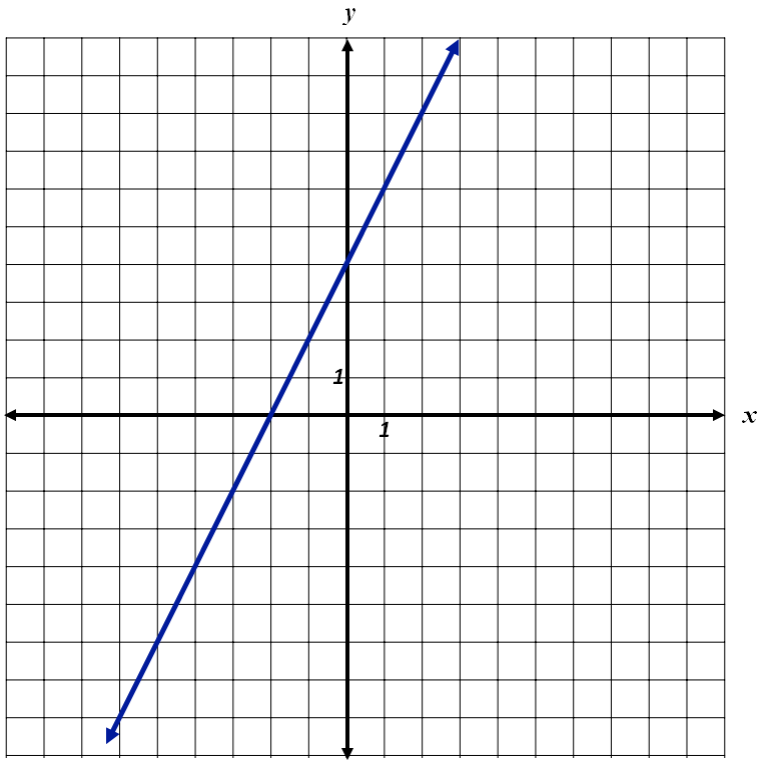
D

x	y
-2	-12
0	6
5	24

Suggested Practice for SOL 7.12

Students need additional practice representing a relationship shown on a coordinate plane as an equation.

Which rule is best represented by this graph?



A $y = 2x + 4$

B $y = 2x - 4$

C $y = -2x - 4$

D $y = -2x + 4$

Suggested Practice for SOL 7.12

Students need additional practice representing a relationship given in words with a table of values.

Larry charges a customer a one-time fee of $15 plus $40 each week. Which table has values that represent this situation?

A

Number of Weeks	Total Amount of Charges
1	$15
3	$45

C

Number of Weeks	Total Amount of Charges
1	$55
3	$135

B

Number of Weeks	Total Amount of Charges
1	$55
3	$165

D

Number of Weeks	Total Amount of Charges
1	$15
3	$95

Identifying Algebraic Expressions

SOL 7.13

The student will

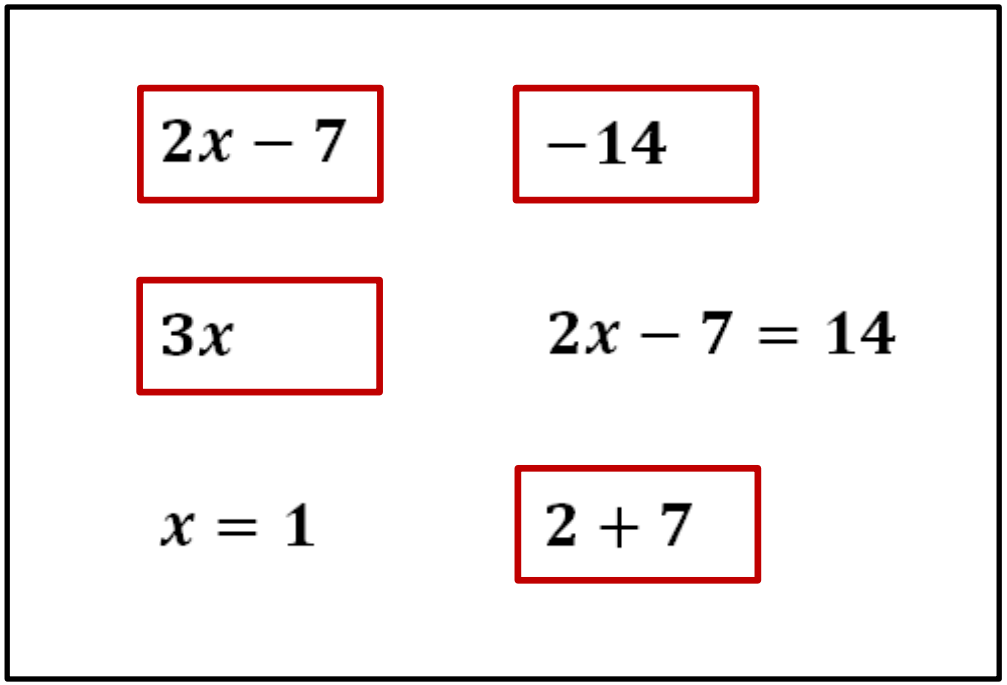
a) **write verbal expressions as algebraic expressions and sentences as equations and vice versa; and**

b) **evaluate algebraic expressions for given replacement values of the variables.**

Suggested Practice for SOL 7.13

Students need additional practice identifying expressions.

Select each of the following that is an expression.



Solving Inequalities

SOL 7.15

The student will

a) solve one-step inequalities in one variable; and

b) graph solutions to inequalities on the number line.

Suggested Practice for SOL 7.15a

Students need additional practice solving one-step inequalities in one variable.

Complete the solution set for the inequalities using one of the symbols and one of the numbers from the choices shown.

$-4n < 16$

n	$>$	-4
	$>$	4
	$<$	-4
		64
		-64

$-30 > 6y$

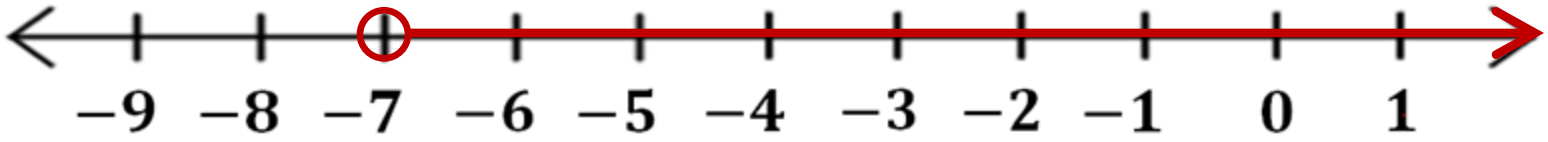
-5	$>$	y
5	$>$	
-5	$<$	
180		
-180		

Suggested Practice for SOL 7.15b

Students need additional practice graphing solutions to one-step inequalities on a number line.

Graph the solution set to the inequality shown.

$$-3 < n + 4$$



Applying Properties

SOL 7.16

The student will apply the following properties of operations with real numbers:

a) **the commutative and associative properties for addition and multiplication;**

b) **the distributive property;**

c) **the additive and multiplicative identity properties;**

d) **the additive and multiplicative inverse properties; and**

e) **the multiplicative property of zero.**

Suggested Practice for SOL 7.16

Students need additional practice applying the properties of operations with real numbers.

Which expression completes this equation using only the multiplicative property of zero?

$$(5 + 0) + (-4 + 4) - (6 \cdot 0) = \underline{?}$$

A $(5) + (-4 + 4) - (6 \cdot 0)$ — Uses the Identity Property of Addition

B $(5 + 0) + (0) - (6 \cdot 0)$ — Uses the Inverse Property of Addition

C $(5 + 0) + (-4 + 4) - (0)$

D $(0 + 5) + (-4 + 4) - (6 \cdot 0)$ — Uses the Commutative Property of Addition

Suggested Practice for SOL 7.16

Which equation illustrates the multiplicative identity property?

A $(8-5)\cdot 0=0$

Uses the Multiplicative Property of Zero

B $\left(\frac{3}{8}\cdot\frac{1}{2}\right)\cdot 1=\left(\frac{3}{8}\cdot\frac{1}{2}\right)$

C $(8+0)\cdot 1=(8)\cdot 1$

Uses the Identity Property of Addition

D $\left(\frac{2}{3}\cdot\frac{3}{2}\right)\cdot 5=(1)\cdot 5$

Uses the Inverse Property of Multiplication

Practice Items

This concludes the student performance information for the spring 2014 Grade 7 Mathematics SOL test.

Additionally, test preparation practice items for Grade 7 Mathematics can be found on the Virginia Department of Education Web site at:

http://www.doe.virginia.gov/testing/sol/practice_items/index.shtml#math

Contact Information

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